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AUTHOR Herman, David O.; Young, Laura
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ABSTRACT

A study involving a sample of people selected to represent the nonimpaired American population, aged 16 to 74 years, was undertaken to determine the effectiveness of the Wechsler Memory Scale--Revised. The scale's subtests were designed to assess memory of personal and general knowledge, logical memory, verbal paired association, figural memory, visual paired association, visual reproduction, mental control, digit span, visual reproduction, and visual memory span. The sample population on which the study was performed included 50 persons from each of six age groups. Each age group was divided approximately equally by sex and was selected to demographically match the general population. Results indicate that the revision of the memory scale incorporates many features that should help assure its continued place in clinical assessments. These features include up-to-date norms for persons aged 16-74 years, broadened coverage of nonverbal memory, improved scoring criteria for logical memory and visual reproduction, reporting of scores corresponding to verbal and visual memory as well as the attention/concentration factor and delayed recall, guidelines for identifying significant differences between certain subtest indexes, and validity studies of patients in each of several diagnostic categories. (TJH)

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SYMPOSIUM:

CLINICAL INVESTIGATION OF MEMORY WITH THE WECHSLER MEMORY SCALE--REVISED

Development of the Wechsler Memory Scale--Revised

by:

David O. Herman
Measurement Research Services, Inc.

and

Laura Young
The Psychological Corporation

U.S. DEPARTMENT OF EDUCATION
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Development of the Wechsler Memory Scale--Revised

The Wechsler Memory Scale was originally published in 1945, over 40 years ago. It contained seven short subtests that measured certain aspects of learning, short-term memory, and general orientation, and was intended by David Wechsler as a "rapid, simple, and practical memory examination."

Although the scale was for many years unique in its field and has been an important part of the clinical repertoire, some users have expressed concern about its limitations, of which some of the most important are these: the norms are old and may not reflect contemporary levels of performance; scores on all subtests are combined into a single summary score, the Memory Quotient, that does not differentiate among various facets of memory; the content stresses verbal material, with only one subtest that presents nonverbal stimuli; the scale includes no measures of delayed recall of learned material; and the scoring rules for two of the subtests are too brief and imprecise for good interscorer agreement.

The general revision of the scale began with the development of three entirely new nonverbal subtests: a recognition task involving abstract visual forms (Figural Memory), a color-form paired associate task (Visual Paired Associates), and a nonverbal analog of the familiar digit span task (Visual Memory Span). These were prepared by Dr. Wechsler, with some further refinement carried out by the publisher following the author's death.

The 13 subtests of the Wechsler Memory Scale--Revised, or WMS-R, are listed in the right-hand column of your handout. (They are not listed here in the order in which they are actually administered.)

The first subtest, Information and Orientation Questions, contains questions concerning personal and current information, such as "Where were you born?" and "Who is the President of the United States?"; and orientation to time and place such as "What day of the week is it?"

On Logical Memory I, the examinee listens to two stories. After hearing each one, he or she is asked to repeat it from memory.

On Verbal Paired Associates I, the examinee is read a group of eight word pairs, such as "Metal-Iron"; then the first word of each pair is read and the examinee must supply the second word from memory.

Figural Memory is one of the three new subtests. Here the examinee looks briefly at a set of abstract designs like the three you see on the screen. The task is to identify them among a larger group of designs like those on the next slide.

Visual Paired Associates I is the second new subtest, and is a visual analog of Verbal Paired Associates. The examinee is shown six abstract line drawings, each paired with a different color, like the pair shown on the screen. The figures are then shown one by one without the colors, and the examinee is to point to the correct color.

In Visual Reproduction I, the examinee looks at each of four designs, shown on the next four slides. After seeing each one briefly, the examinee draws it from memory.

The Mental Control subtest requires the examinee to repeat a familiar series of numbers of letters, such as counting backward from 20 to 1.

The Digit Span subtest is familiar from the various Wechsler intelligence scales, and contains the usual forward and backward series.

The Visual Memory Span subtest is a visual analog of Digit Span. The examiner touches the colored squares on a card in sequences of increasing length. After each sequence, the examinee reproduces the examiner's performance from memory. This is followed by a backward series in which the examinee repeats the examiner's tapped sequence in reverse.

Following Visual Memory Span on your handout, you will see that four of the subtests, two verbal and two nonverbal, are administered a second time. The second presentations follow the first by an interval of about one-half hour, and make possible a measure of recall after a substantial delay.

So much for the content of the WMS-R. This set of tasks was standardized on a sample of people selected to represent the nonimpaired U.S. population from age 16 to 74. The sample consisted of approximately 50 cases at each of six age groups: 16-17, 20-24, 35-44, 55-64, 65-69, and 70-74. Each age group was about equally divided by sex, and was carefully selected to match the

general population in terms of race, geographic region, and education. General ability as estimated by Full Scale IQ on the WAIS-R was also controlled in the sampling. Norms for the age groups not tested (18-19, 25-34, and 45-54) were derived by interpolation between adjacent age groups.

I noted earlier that the original scale reported a single overall score to summarize performance on all subtests. However, an important goal of this revision was to report subscores for various meaningful components of performance. Based on several strands of evidence--factor analysis of both the original and revised scales, clinical evidence from the original scale, and rational considerations--the following decisions were made with regard to the kinds of scores for which WMS-R norms would be presented.

To keep Information and Orientation Questions separate from the rest of the scale, and to use this subtest for screening purposes;

To report two major scores, the General Memory Index and the Attention/Concentration Index. The latter score appears to correspond to the "Freedom from Distractibility" factor commonly found in analyses of Wechsler intelligence scales;

To break down the General Memory Index into two subsidiary scores, the Verbal Memory Index and the Visual Memory Index;

To report a Delayed Recall Index summarizing performance on the four delayed-recall subtests;

To report percentile norms for selected subtests: the forward and backward trials of both Digit Span and Visual Memory Span, and both the immediate-recall and delayed-recall trials of Logical Memory and Visual Reproduction.

In preparing the norms, raw scores on the subtests were weighted by a procedure designed to maximize the reliability of the composite scores. The resulting weighted composites were then transformed to the indexes mentioned above (and shown on the handout). These indexes are scaled to the same metric as the familiar Wechsler IQs, with a mean of 100 and a standard deviation of 15 for each age group tested. The indexes included in the norms range from a low of 40 to a high of 150, with the extreme values extrapolated beyond the actual standardization data. It should be mentioned here that although Memory Indexes of 40 represent a point below which only about four people in 10,000 will fall in the general population, clinicians will find that many patients with impaired memory functioning will score well below this point.

To summarize, the revision of the Wechsler Memory Scale incorporates many features that should help assure its continued place in clinical assessment:

Up-to-date norms for people aged 16 through 74 years, with index scores covering a wide range of ability

Broadened coverage of nonverbal, visual memory

Improved scoring criteria for the Logical Memory and Visual Reproduction subtests

Reporting of scores corresponding to verbal and visual memory, the attention/concentration factor familiar from research on cognitive abilities, and delayed recall

Guidelines for identifying significant differences between certain indexes (General Memory - Attention/Concentration; Verbal Memory - Visual Memory; General Memory - Delayed Recall)

Validity studies of patients in each of several diagnostic categories, some of which will be described later in this session

Handout to accompany
"Development of the Wechsler Memory Scale--Revised"
APA Annual Convention, 1987

Indexes Reported and Contributing Subtests

(No Index reported)		Information and Orientation Questions (formerly Personal and Current Information, and Orientation)
General Memory	Verbal Memory	Logical Memory I
		Verbal Paired Associates I (formerly Associate Learning)
	Visual Memory	*Figural Memory
		*Visual Paired Associates I
		Visual Reproduction I
Attention/Concentration		Mental Control
		Digit Span
		*Visual Memory Span
Delayed Recall		*Logical Memory II
		*Verbal Paired Associates II
		*Visual Paired Associates II
		*Visual Reproduction II

*New subtest

The Psychological Corporation
San Antonio, TX 78204